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either in the cellular tissue, or in the minute blood-vessels of the iris. It is from elasticity, he believes, that the iris derives its power of accommodation to changes of size, and its tendency to return to its natural state from extremes, either of dilatation or of contraction; but beyond this, elasticity is not concerned in its movements.

February 16, 1843.

GEORGE RENNIE, Esq., V.P., in the Chair.

The following papers were read, viz.—

1. “Tide-Observations at Tahiti:” by Captain Edward Belcher, R.N. Communicated by Captain Beaufort, R.N., F.R.S., &c.

This paper consists of copies of the Tide Journal, registered at the Island of Motuatu, in the Harbour of Papeete, and of a short comparative series made at Point Venus. They were conducted by Mr. McKinley Richardson, Mate. The construction of the tide-gauge is described; and an account is given of the methods of observation, and of the precautions adopted to ensure accuracy. The results are specified in the following letter from the author to Captain Beaufort, which accompanies the paper:—

“Her Majesty’s Ship Sulphur, Woolwich, August 2, 1842.

“SIR,—Referring to the Tide Registries, forwarded on my arrival, I beg leave to offer the following general remarks upon the tides at Tahiti.

“In consequence of your very special instructions relative to the determination of the *actual periods* of high water at the Island of Tahiti, the most minute attention was paid to this subject; and as these periods could only be *approximated*, recourse was had to my old method (successfully practised in the Lancashire survey), of deriving them from the Equal-altitude system.

“By a reference to the Tide Registry annexed, it will be found that there are *two distinct periods of high water*, during each interval of twenty-four hours; and that during the seven days preceding, and seven days following the full and change, they are confined between the limits of 10 A.M. and 2<sup>h</sup> 30<sup>m</sup> P.M., the whole range of interval, by day as well as by night, being about 4<sup>h</sup> 27<sup>m</sup>.

“Commencing with the seventh day preceding the full moon, viz. the 9th of April, it will be perceived that high water occurs at 10 A.M., this being the greatest A.M. interval from noon; and that on the 16th, at the full moon, it occurs nearly at noon.

“Passing on to the 23rd, it reaches the greatest P.M. limit at 2<sup>h</sup> 30<sup>m</sup>, and on the 2nd of May again reaches the noon period.

“Between the 23rd and 24th, however, a sudden anomaly presents itself. Throughout the day of the 23rd, the variation of the level does not exceed 2½ inches, and the general motion is observed to be ‘irregular.’ The time of high water is also the extreme P.M. limit.

"On the 21th we discover that it has suddenly resumed *the most distant A.M. period*, viz. 10 A.M., but proceeds regularly to the noon period at the change.

"Although the differences of level do not at full and change exceed 1 foot  $4\frac{1}{2}$  inches, still I presume that we have sufficient data to establish the fact,—that it is *not invariably high water at noon* (as asserted by Kotzebue, Beechey and others); and, further, that we have corresponding *nightly periods* of high water.

"It is evident that the time of high water at full and change may be assumed as that of noon, because we have sufficiently decided changes of level to fix the approximate period of high water.

"It does not appear by these Registers, that any higher levels result from the rollers sent in by the strong sea breezes (as asserted by several writers), but rather the contrary, the highest levels being indicated during the night, when the land breezes prevailed.

"I have great satisfaction in presenting you with these facts, and trust that they may induce others to follow up the same experiments, so as, eventually, to obtain the variations which other seasons may produce.

"I am, Sir, your most obedient servant,

"EDWARD BELCHER, *Captain.*"

"*Captain Beaufort, R.N., F.R.S., Hydrographer.*"

2. "On Fissiparous Generation:" by Martin Barry, M.D., F.R.S. L. and Ed.

The author observes that the blood-corpuscle and the germinal vesicle resemble one another in the circumstance of an orifice existing in the centre of the parietal nucleus of both. He pursues the analogy still farther, conceiving that as a substance of some sort is introduced into the ovum through its orifice, which the author terms *the point of fecundation*, so the corpuscles of the blood may undergo a sort of fecundation through their corresponding orifice; and also that the blood-corpuscle, like the germinal vesicle, is propagated by self-division of its nucleus; a mode of propagation which he believes to be common to cells in general. The nucleus of the germinal vesicle, or original parent cell of the ovum, gives origin, by self-division, to two young persistent cells, endowed with qualities resulting from the fecundation of the parent cell; these two cells being formed by assimilation, out of a great number of minuter cells which had been previously formed. This account of the process, which takes place in the reproduction of the entire organism, explains, according to Dr. Barry, the mysterious reappearance of the qualities of both parents in the offspring.

Certain nuclei, which the author has delineated in former papers as being contained within and among the fibres of the tissues, he conceives to be, in like manner, centres of assimilation, from observing that they present the same sort of orifice, that they are reproduced by self-division, and that they are derived from the original cells of development; that is, from the nuclei of the corpuscles of the blood. He considers that assimilation of the substance intro-